REMARKS

Claims 1-16, as amended, remain herein. Claims 1 and 2 have been amended. Claim 16 has been added. Support for the amendments and the new claim may be found throughout the specification. See, e.g., Example 3 (stating that the electron injecting layer directly adheres to the light emitting layer) at page 80; Comparative Examples 1-3 and 5 at Table 1, page 88 (using 4,4'-bis(N-carbazolyl)biphenyl (CBP) as the host material for the light emitting layer); page 6, lines 8-12 (stating that a hole blocking layer is not used); and page 11, lines 3-4 (stating that an ionization potential of the host material is 5.9 eV or smaller and preferably 5.8 eV or smaller).

The specification has been amended to correct a clerical error. Support for the amendment may be found at page 78 of the specification (see Comparative Example 2 (using the same electron injecting layer as Example 1)).

1. The specification was objected to for including CBP, a material that meets the limitations of claims 1 and 2. Claims 1 and 2 have been amended to exclude CBP. In addition, new claim 16 recites a host material having an ionization potential of 5.8 eV or smaller which excludes CBP.

2. Claims 1, 2, 4, 6-10 and 14 were rejected under 35 U.S.C. § 102(b) over Okada et al. US Patent Application Publication 2002/055014 as evidenced by Matsushima et al., *Current Applied Physics* **2005**, 5, 305-308.

Claim 1 and 2 recite an organic electroluminescence device comprising an electron injecting layer adhered directly to the light emitting layer, wherein the host material of the light

emitting layer does not include 4, 4'-bis(N-carbazolyl)biphenyl and the organic electroluminescence device does not include a hole blocking layer.

Okada does not disclose applicants' claimed invention. Okada discloses the use of CBP as the host material for the light emitting layer while such material is excluded from the scope of applicants' claims. In addition, in Okada's light-emitting device, the light emitting layer does not adhere directly to the electron injection layer but to a hole blocking layer comprising bathocuproine (BCP) (see Tanaka et al. article -cited in the Office Action, at page 2738 (stating that BCP is a hole-blocking layer)). Applicants' claimed invention, on the other hand eliminates the need to use a hole blocking layer. As explained in applicants' specification:

> However, it was found that the conventional constructions for electron injection have problems. Namely, because the hole blocking layer has large energy gap, and because it works with great resistance as an energy barrier for charge injection transport from the other layer, the driving voltage elevated. Further, although many compounds used for the hole blocking layer held favorable hole barrier capability, they tended to deteriorate, and failed to provide an organic EL device with long lifetime.
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> ...
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> As the result of intensive researches and studies to achieve the above object by the present inventors, the first aspect of the present invention provides an organic EL device, which comprises an light emitting layer consisting of at least phosphorescent light emitting material and a host material, a cathode, and an electron injecting layer adhered to the light emitting layer and at the same time sandwiched between the light emitting layer and the cathode, without employing any hole blocking layer. Further, the first aspect of the invention made the energy gap of electron transporting material in electron injecting layer smaller than that of the host material in the light emitting layer. According to the conventional comprehension by the persons skilled in the art, the above settlement will let the electron injecting layer deactivates the excitation state generated in the light emitting layer and only the EL devices with extremely low efficiency will be provided. In the present invention, however, enabling the light emitting layer electron transporting, an electron-hole recombination zone will separate from the interface between the electron injecting layer and the light emitting layer resulting in avoidance of deactivation. Besides, an EL device with high efficiency without the use of the hole blocking layer in the conventional organic EL device is provided by making the ionization potential of the host material 5.9 eV or lower in order to enable holes easily inject into the host material in the light emitting layer. Further, the driving voltage can be decreased because the holes are injected into the host material in the light emitting layer thereby allowing the

> transportation, and an organic EL device with long lifetime can be obtained because any hole blocking layer that easily deteriorates is not employed. Furthermore, the organic EL device is easily producible because its constitution became simple. Moreover, it was ensured that the energy gap of electron transporting material in electron injecting layer smaller than that of the host material in the light emitting layer has also an effect of promoting injection of electrons from cathode as well as decreasing the driving voltage.

Applicants' specification at page 4, lines 8-14 and page 5, line 16 to page 6, line 21 (emphasis added here). See also new claim 16 which recites an ionization potential of 5.8 eV or smaller for the host material, which excludes CBP.

Thus, Okada does not disclose all elements of applicants' claims and therefore is not an adequate basis for a rejection under 35 U.S.C. § 102(b). Applicants respectfully request reconsideration and withdrawal of this rejection.

3. Claim 2 was rejected under 35 U.S.C. § 103(a) over Fujino et al. JP 2000-169448 in view of Okada as evidenced by Tanaka et al., *Japan Journal of Applied Physics* **2003**, 42, 2737-2740.

The Office Action admits that Fujino does not teach a phosphorescent dopant in the light emitting layer but that Okada teaches phosphorescent dopants. However, a person of ordinary skill in the art would not be motivated simply to substitute Fujino's fluorescent dopants with phosphorescent dopants. As explained in applicants' specification, a hole blocking layer is typically used in phosphorescent devices to prevent the quench of triplet excited states and to achieve sufficient device efficiency (applicants' specification at page 3, line 11 to page 4, line 14). See also Baldo et al. US Patent 6,097,147 at column 2, lines 1-26 and column 3, lines 22-60; and Thompson et al. US Patent 7,078,113 at column 2, line 55 to column 3, line 6.

Evidence of long felt but unsolved needs and failure of others (see MPEP § 2145 citing Graham v. John Deere Co., 383 U.S. 1, 17 (1966)), and evidence that the claimed invention yields unexpectedly improved properties or properties not present in the prior art (see MPEP § 2145 citing In re Dillon, 919 F.2d 688, 692-93 (Fed. Cir. 1990)), may rebut alleged obviousness. Applicants' claimed invention solves a long felt problem by eliminating the need for a hole blocking layer and yields unexpected results by achieving great efficiency of light emission without the use of a hole blocking layer (compare applicants' Example 5 and Comparative Example 6 at Table 1, page 88 of applicants' specification (showing that Comparative Example 6 required higher voltage to achieve about the same efficiency of light emission)).

Thus, applicants' claims are not obvious over Fujino in view of Okada. Furthermore, Fujino and Okada disclose nothing that would have suggested applicants' claimed invention to one of ordinary skill in the art. There is no disclosure or teaching in any of Fujino, Okada, or anything else in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

4. Claim 3 was rejected under 35 U.S.C. § 103(a) over Okada, as evidenced by Matsushima, in view of Hung et al. US Patent 6,137,223. Claim 5 was rejected under 35 U.S.C. § 103(a) over Okada, as evidenced by Matsushima, in view of Adachi et al., *Organic Electronics* **2001**, 2, 37-43. Claims 11-13 were rejected under 35 U.S.C. § 103(a) over Okada, as evidenced by Matsushima, in view of Okada US Patent 6,656,612. Claim 15 was rejected under 35 U.S.C. § 103(a) over Okada, as evidenced by Matsushima.

As discussed above, Okada does not teach or suggest all elements of applicants' claims. None of Hung, Adachi and Okada '612 teaches or suggests what is missing from Okada.

Thus, applicants' claims are not obvious over any of Okada, Hung, Adachi, and/or Okada '612. Furthermore, none of Okada, Hung, Adachi, and Okada '612 disclose anything that would have suggested applicants' claimed invention to one of ordinary skill in the art. There is no disclosure or teaching in any of Okada, Hung, Adachi, Okada '612, or anything else in this record, that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Applicants respectfully request reconsideration and withdrawal of each of these rejections.

Accordingly, this application is now fully in condition for allowance and a notice to that effect is respectfully requested. The PTO is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293. If further amendments would place this application in even better condition for issue, the Examiner is invited to call applicants' undersigned attorney at the number listed below.

Respectfully submitted,

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